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U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

**TRANSMITTAL LETTER TO THE UNITED STATES  
DESIGNATED/ELECTED OFFICE (DO/EO/US)  
CONCERNING A FILING UNDER 35 U.S.C. 371**

032013-036

U.S. APPLICATION NO. (If known, give PCT No.)

Unassigned

INTERNATIONAL APPLICATION NO.  
PCT/FR00/01677INTERNATIONAL FILING DATE  
June 16, 2000PRIORITY DATE CLAIMED  
June 18, 1999

TITLE OF INVENTION

BULLET WITH AN INTERNALLY CARRIED SUB-PROJECTILE

APPLICANT(S) FOR DO/EO/US

Jean-Claude SAUVESTRE

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. ☐ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
  - a. ☒ is attached hereto (required only if not communicated by the International Bureau).
  - b. ☐ has been communicated by the International Bureau.
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2))
  - a. ☒ is attached hereto.
  - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
  - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
  - b. ☐ have been communicated by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☒ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11 to 20 below concern document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A **FIRST** preliminary amendment.
14. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
15. ☐ A substitute specification.
16. ☐ A change of power of attorney and/or address letter.
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
18. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. ☒ Other items or information:

International Search Report; Three Sheets of Drawings, containing Figures 1-11



21839

U.S. APPLICATION NO. (IF KNOWN) 1077-1077  
Unassigned

INTERNATIONAL APPLICATION NO.  
PCT/FR00/01677

ATTORNEY'S DOCKET NUMBER  
032013-036

21. ☒ The following fees are submitted:

CALCULATIONS

PTO USE ONLY

Basic National Fee (37 CFR 1.492(a)(1)-(5)):

Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO ..... \$1,040.00 (960)  
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO ..... \$890.00 (970)  
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... \$740.00 (958)  
International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) ..... \$710.00 (956)  
International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) ..... \$100.00 (962)

ENTER APPROPRIATE BASIC FEE AMOUNT = \$ 890.00

Surcharge of \$130.00 (154) for furnishing the oath or declaration later than months from the earliest claimed priority date (37 CFR 1.492(a)). 20 ☐ 30 ☐

Claims	Number Filed	Number Extra	Rate
Total Claims	17 -20 =	0	X\$18.00 (966)
Independent Claims	1 -3 =	0	X\$84.00 (964)
Multiple dependent claim(s) (if applicable)			+ \$280.00 (968)

TOTAL OF ABOVE CALCULATIONS = \$ 890.00

Reduction for 1/2 for filing by small entity, if applicable (see below). + \$ -

SUBTOTAL = \$

Processing fee of \$130.00 (156) for furnishing the English translation later than months from the earliest claimed priority date (37 CFR 1.492(h)). 20 ☐ 30 ☐

TOTAL NATIONAL FEE = \$ 890.00

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 (581) per property + \$

TOTAL FEES ENCLOSED = \$ 890.00

Amount to be refunded: \$

charged: \$

a. ☐ Small entity status is hereby claimed.

b. ☒ A check in the amount of \$ 890.00 to cover the above fees is enclosed.

c. ☐ Please charge my Deposit Account No. 02-4800 in the amount of \$ to cover the above fees. A duplicate copy of this sheet is enclosed.

d. ☐ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 02-4800. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

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SIGNATURE

E. Joseph Gess

NAME

28,510

REGISTRATION NUMBER

December 18, 2001

DATE

10/018182

JC05 Rec'd PCT/FTO 1 8 DEC 2001

Patent

Attorney's Docket No. 032013-036

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of )  
)  
Jean-Claude SAUVESTRE ) Group Art Unit: Unassigned  
)  
Application No.: Unassigned ) Examiner: Unassigned  
)  
Filed: December 18, 2001 )  
)  
For: BULLET WITH AN INTERNALLY )  
CARRIED SUB-PROJECTILE )

**PRELIMINARY AMENDMENT**

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

Prior to examination, please first amend the above-identified application as follows:

**IN THE SPECIFICATION:**

Page 1, after the title, please insert

**--BACKGROUND OF THE INVENTION**

**Field of the Invention --;**

Page 1, after line 5, please insert

**-- Description of Related Art --;**

RECEIVED  
DEC 18 2001  
PCT/FTO

Page 1, after line 18, please insert

**-- SUMMARY OF THE INVENTION --.**

Page 6, after line 7, please insert

**-- BRIEF DESCRIPTION OF THE FIGURES OF THE DRAWINGS --;**

Page 7, after line 11, please insert

**-- DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS --.**

**IN THE CLAIMS:**

Kindly replace Claims 1-15, and add new Claims 16-17, as follows.

1. Ammunition for small-, medium- and large-caliber weapons, consisting of a bullet with the same caliber as the weapon or which is subcaliber, comprising a profiled front part, a central part, and a rear part which may bear fins, wherein the bullet contains, along its axis, an internal core with rigidity greater than that of the body of the bullet.
2. The ammunition as claimed in claim 1, wherein the internal core extends over the front part and the central part of the bullet.
3. The ammunition as claimed in claim 2, wherein the internal core is housed in an axial hole which is open at the front of the bullet.

4. The ammunition as claimed in claim 3, wherein the internal core passes right through it and runs from the rear part to the front part of the bullet.

5. The ammunition as claimed in Claim 3, wherein the front face of the internal core is set back from the front face of the front part of the bullet.

6. The ammunition as claimed in Claim 3, wherein the internal core protrudes and its front end extends beyond the front face of the bullet.

7. The ammunition as claimed in Claim 1, wherein the internal core consists of one single homogeneous element.

8. The ammunition as claimed in Claim 1, wherein the internal core consists of at least two consecutive elements arranged contiguously along the same axis.

9. The ammunition as claimed in claim 8, wherein the internal core comprises a first cylindrical element and one or more balls of approximately equal diameter.

10. The ammunition as claimed in Claim 1, wherein the internal core consists of a rod having symmetry of revolution and comprising ribs over part of its surface.

11. The ammunition as claimed in claim 10, wherein the internal core has annular, helical or longitudinal ribs.

12. The ammunition as claimed in claim 11, wherein the internal core has two to six longitudinal ribs arranged symmetrically with respect to the axis.

13. The ammunition as claimed in Claim 3, wherein the front part of the body of the bullet has rupture initiators.

14. The ammunition as claimed in Claim 1, wherein the internal core is made of steel, brass, copper or aluminum alloy.

15. The ammunition as claimed in Claim 1, wherein the body of the bullet is made of copper or brass containing 5 to 40% zinc.

--- 16. (New) The ammunition as claimed in Claim 4, wherein the front face of the internal core is set back from the front face of the front part of the bullet.

17. (New) The ammunition as claimed in Claim 4, wherein the internal core protrudes and its front end extends beyond the front face of the bullet. --

**REMARKS**

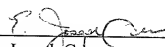
Entry of the foregoing, examination and consideration of the subject matter identified in caption, as amended, pursuant to and consistent with 37 C.F.R. §1.112, and in light of the remarks which follow, are respectfully requested.

Claims 1-15 have been amended in order to delete multiple dependencies therefrom and to place them in compliance with U.S. practice. New Claims 16-17 have been presented to round out the scope of protection to which Applicant is entitled. As well, the Specification has been amended to incorporate appropriate headings in accordance with U.S. practice.

Favorable consideration on the merits is respectfully requested.

Respectfully submitted,

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By:   
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Date: December 18, 2001

**Attachment to Preliminary Amendment dated December 18, 2001**

**Marked-up Copy of the Specification and Claims 1-15.**

Page 1, after the title, please insert:

**--BACKGROUND OF THE INVENTION**

**Field of the Invention --;**

Page 1, after line 5, please insert:

**-- Description of Related Art --;**

Page 1, after line 18, please insert:

**-- SUMMARY OF THE INVENTION --.**

Page 6, after line 7, please insert:

**-- BRIEF DESCRIPTION OF THE FIGURES OF THE DRAWINGS --;**

Page 7, after line 11, please insert:

**-- DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS --.**



**Attachment to Preliminary Amendment dated December 18, 2001**

**Marked-up Copy of the Specification and Claims 1-15.**

1. (Amended) Ammunition for small-, medium- and large-caliber weapons, consisting of a bullet with the same caliber as the weapon or which is subcaliber, comprising a profiled front part [(4)], a central part [(2)], and a rear part [(1)] which may bear fins [(12)], [characterized in that] wherein the bullet contains, along its axis, an internal core [(6)] with rigidity greater than that of the body of the bullet.

2. (Amended) The ammunition as claimed in claim 1, [characterized in that] wherein the internal core [(6)] extends over the front part [(4)] and the central part [(2)] of the bullet.

3. (Amended) The ammunition as claimed in claim 2, [characterized in that] wherein the internal core [(6)] is housed in an axial hole [(5)] which is open at the front of the bullet.

4. (Amended) The ammunition as claimed in claim 3, [characterized in that] wherein the internal core [(26, 27)] passes right through it and runs from the rear part to the front part of the bullet.

**Attachment to Preliminary Amendment dated December 18, 2001**

**Marked-up Copy of the Specification and Claims 1-15.**

5. (Amended) The ammunition as claimed in [either of claims 3 and 4 characterized in that] Claim 3, wherein the front face of the internal core is set back from the front face of the front part of the bullet.

6. (Amended) The ammunition as claimed in [either of claims 3 and 4, characterized in that] Claim 3, wherein the internal core [(20)] protrudes and its front end [(21)] extends beyond the front face [(22)] of the bullet.

7. (Amended) The ammunition as claimed in [any of claims 1 to 6, characterized in that] Claim 1, wherein the internal core [(6)] consists of one single homogeneous element.

8. (Amended) The ammunition as claimed in [any of claims 1 to 6, characterized in that] Claim 1, wherein the internal core consists of at least two consecutive elements [(15, 16)] arranged contiguously along the same axis.

**Attachment to Preliminary Amendment dated December 18, 2001**

**Marked-up Copy of the Specification and Claims 1-15.**

9. (Amended) The ammunition as claimed in claim 8, [characterized in that] wherein the internal core comprises a first cylindrical element [(23)] and one or more balls [(24)] of approximately equal diameter.

10. (Amended) The ammunition as claimed in [any of the preceding claims, characterized in that] Claim 1, wherein the internal core consists of a rod [(6)] having symmetry of revolution and comprising ribs over part of its surface.

11. (Amended) The ammunition as claimed in claim 10, [characterized in that] wherein the internal core [(6)] has annular, helical or longitudinal ribs.

12. (Amended) The ammunition as claimed in claim 11, [characterized in that] wherein the internal core has two to six longitudinal ribs [(7)] arranged symmetrically with respect to the axis.

13. (Amended) The ammunition as claimed in [any of claims 3 to 6, characterized in that] Claim 3, wherein the front part of the body of the bullet has rupture initiators.

**Attachment to Preliminary Amendment dated December 18, 2001**

**Marked-up Copy of the Specification and Claims 1-15.**

14. (Amended) The ammunition as claimed in [any of the preceding claims, characterized in that] Claim 1, wherein the internal core [(6)] is made of steel, brass, copper or aluminum alloy.

15. (Amended) The ammunition as claimed in [any of the preceding claims, characterized in that] Claim 1, wherein the body of the bullet is made of copper or brass containing 5 to 40% zinc.

3/PRTS

16/018182

JC05 Rec'd PGM/TC 1 8 DEC 2001

Attorney Docket No. 032013-036

**BULLET WITH AN INTERNALLY CARRIED SUB-PROECTILE**

The present invention relates to ammunition for small-, medium- and large-caliber weapons, and more particularly to a novel type of core bullet, particularly  
5 for hunting weapons, having improved efficiency, essentially against soft targets.

Core bullet ammunition comprises a fin-stabilized subprojectile (core) associated with a sabot (or launcher) with the same caliber as the weapon, the entities lying in a crimped closed cartridge also comprising a primed case and a propellant charge. Ammunition of this type is described for example in patent FR-  
10 A-2 555 728.

Also known from other sources is various ammunition designed to deform upon impact, for example expansion munitions such as in application WO 97/40334, the head of which has slots constituting deformation initiators. U.S. Patent 4,685,397 describes a bullet producing a similar effect by means of a  
15 cap which can be driven into a cylindrical hole formed along the axis of the head of the bullet, upsetting the walls outwardly. U.S. Patent 3,881,421 describes a bullet in which the head is hollowed out to cause it to flatten upon impact with the target.

The present invention relates to bullet core ammunition and relates more  
20 specifically to the subprojectile, also known as the core. It is desirable for the core to deform upon impact with the target, but this deformation needs to be controlled and must not result in excessive dislocation into several small-sized core fragments which may prove dangerous.

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The subject of the invention is a device which makes it possible to obtain controlled deformation of the core upon impact with the soft parts of a target, while at the same time providing the body of the core with sufficient rigidity and cohesion to avoid the formation of multiple fragments and ensure the destruction  
5 of the hard parts of said target.

The device of the invention essentially consists of a bullet with the same caliber as the weapon or which is subcaliber, comprising a profiled front part, a central part, and a rear part which may bear fins, containing, along its axis, an internal core with rigidity greater than that of the body of the bullet.

10 More specifically, the device of the invention consists of a projectile with the same caliber as the weapon, or a subprojectile intended to be used in combination with a launcher which has the same caliber as the weapon, comprising a cylindrical insert with greater rigidity than the remainder of the body of the projectile or subprojectile, placed along its axis and extending at least up  
15 close to the front face of the projectile or subprojectile.

According to one embodiment, the bullet according to the present invention comprises a profiled front part, a central part and a rear part which may carry fins, and the internal core is preferably of a length such that it extends over the front part and the central part of the bullet.

According to an alternative form of the present invention, the internal core passes all the way through the bullet and extends from the rear part to the front part of the bullet, and the rear part of the internal core may act as a support for fins, in the case of a fin-stabilized bullet.

5           This internal core, or insert, constitutes a "supported internal core" because it is inserted into the bullet and supported by it. In the remainder of the description, for reasons of simplicity, it may be termed "internal core" but is to be distinguished from the core that constitutes the subprojectile of fin-stabilized subcaliber core bullets of the known art.

10           According to one advantageous embodiment, the internal core is housed in an axial hole which is open at the front of the bullet, and the front face of the internal core is set back from the front face of the front part of the bullet.

            According to an alternative form of embodiment according to the present invention, the internal core may protrude, that is to say that its front end may  
15   extend out of the axial hole, and may even in certain instances lie forward of the front face of the bullet. Such an arrangement may be particularly advantageous in the case of fin-stabilized bullets.

            The internal core may be made of a single element or of several consecutive elements arranged contiguously along the same axis. It may be advantageous, for  
20   example, to provide an internal core made of two elements. According to an

alternative form of embodiment, the internal core may be of the controlled-fragmentation type and comprise elements which disperse upon impact, for example balls of a diameter roughly equal to that of the internal core. This form of embodiment makes it possible to obtain calibration fragments at the time of impact, and thus improve the lethality of the ammunition by creating secondary injuries.

The internal core, or insert, may be made, for example, of steel, copper, brass or aluminum alloy with high mechanical strength.

The body of the bullet may for example be made of copper or of brass containing 5 to 40% zinc, or a metal alloy with the desired mechanical properties, for example an aluminum or lead alloy. By comparison with conventional techniques, the technique of the invention has the advantage of allowing lead to be replaced completely or partially by another metal or alloy deemed to be non-polluting. In the case of a fin-stabilized bullet, the fins may be made of metal or polymer formed by working plastic over the metal body of the subprojectile, and it may have stabilizing fins.

According to an alternative form according to the present invention, the internal core and the body of the bullet are formed from one and the same base material, for example copper or brass. In this case, of course, the rigidity of the internal core is enhanced by known means so that it is greater than that of the body



of the bullet. The internal core can then be manufactured at the same time as the bullet, from the same material.

The supported internal core, or insert, generally has the shape of a rod having symmetry of revolution and a constant, increasing or decreasing cross section, coaxial with the projectile, as shown in the appended figures. It may be advantageous to provide ribs on the cylindrical surface so as to improve the attachment of the insert to the body of the bullet. These ribs may be annular or helical or, as a preference, may be longitudinal ribs, there being two to six of them over part or all of the length of the cylinder, symmetrically with respect to the axis.

10 In addition, the longitudinal ribs may serve to form rupture initiators on the front face of the bullet when the cylindrical insert is fitted by forcibly introducing it into the hole already bored along the axis of the bullet. If the bullet is obtained by cold deformation, the supported internal core, previously placed along the axis of the blank of the bullet, will impress its longitudinal ribs into the body material offset

15 by means of a press and will thus create the desired rupture initiators.

These rupture initiators, by collaborating with the internal core, encourage the head of the bullet to deform upon impact by forming "petals" or by "mushrooming" into as many elements as there are ribs, around the central internal core which maintains its overall shape and acts as a structure holding the entirety

20 together. They may be associated in combination with circular or longitudinal

grooves made on the periphery of the bullet, preferably in the region to be "mushroomed", that is to say the region in which controlled deformation is brought about.

According to another alternative form, it is possible to provide two inserts  
5 or internal core elements arranged along the axis of the projectile, one behind the other in the hole bored in the subprojectile or in the body of the bullet.

As indicated above, the bullet may be of the spin- or fin-stabilized type. Spin-stabilized bullets are used in a weapon with a rifled barrel, so that the rifling of the barrel, by collaborating with a peg secured to the bullet, causes the latter to  
10 rotate about its axis. Fin-stabilized bullets can be used in smooth bore weapons.

The characteristics and advantages of the invention will become apparent in greater detail in the description below which relates to some non-limiting examples with reference to the appended drawings which depict:

Fig. 1: a schematic view in part section of a spin-stabilized full-caliber  
15 bullet with an internal core according to the invention, for a hunting rifle.

Fig. 2: a cross section of the internal core of the bullet of Fig. 1, on a larger scale.

Fig. 3: a profile view, in part section, of the bullet of Fig. 1, following impact and penetration.

20 Fig. 4: a view in the direction of the arrow A of Fig. 3.

Fig. 5: a simplified half view in part section of a subcaliber bullet with supported internal cores according to the invention, for a hunting gun.

Fig. 6: a profile half view in part section of the subcaliber bullet of Fig. 5 following impact and penetration.

5 Fig. 7: a view in the direction of the arrow B of Fig. 6.

Fig. 8: a simplified half view in part section of an alternative form of the subcaliber bullet of Fig. 5, comprising a protruding internal core.

Fig. 9: a view in part section of an alternative form of the full-caliber spin-stabilized bullet of Fig. 1, comprising an internal core element associated with  
10 balls.

Fig. 10: a view in part section of an alternative form of the full-caliber spin-stabilized bullet of Fig. 1, having a two-element internal core that passes all the way through.

Fig. 11: a profile view in part section of the bullet of Fig. 10 following  
15 impact and penetration.

As shown by Fig. 1, the full-caliber bullet comprises, at its rear part, a narrowed base (1), at its central part a body (2) on which circular grooves (3) are formed, at its front part, an ogive (4), all of this being partially introduced into a primed case containing a charge (not depicted).

A hole (5) is bored in the front face of the ogive (4) along the axis of the bullet and contains the supported internal core (6) provided on its surface with several longitudinal ribs (7). A conical mouth (9) makes it easier to initiate the "mushrooming".

5            Fig. 2 shows the position of four ribs (7) on the surface of the supported internal core (6) arranged symmetrically with respect to the axis and uniformly distributed around the periphery of the said core. The ridges of these ribs (7) bear against the interior wall of the hole (5). They have the advantage of causing the formation of rupture initiators in the thickness of the ogive (4) on the periphery of  
10 the hole (5) when the internal core forcibly inserted into the hole (5) is fitted during manufacture.

The ogive (4) may have one or more circular grooves (8) which facilitate the speed and ability of the petals (10) to roll back, as specified by Figs. 3 and 4 so as better to control the deformation on impact and during the hit.

15            As Fig. 5 shows, the subcaliber bullet (11) is equipped with fins (12) at its rear part, and is enveloped by a launching sabot (13) depicted in dotted line, all this being in a primed case filled with charge, not depicted.

A hole (14) is bored in the front face of the bullet (11), along its axis, and contains two supported internal cores mounted in tandem as shown by Fig. 5. The  
20 rear supported internal core (15) has a helical furrow (17) in combination with the

partial screwthread of the hole (14). The front supported internal core (16) bearing against the rear supported internal core (15) has several ribs (18) on its surface.

The ribs on the surface of the internal core (16) may number three, arranged symmetrically with respect to the axis. The ridges of these ribs press against the interior wall of the hole (14). The helical furrow (17) is formed at the surface of the rear supported internal core (16).

The front face (19) of the subcaliber bullet (11) may have an appropriate shape, collaborating with the metal insert to control the deformation upon impact. This annular front region (19) may, for example, have one of the shapes depicted in Figures 5a to 5h of French Patent 2 599 828. An illustration of the result obtained upon firing is specified in Figs 6 and 7.

According to an alternative form of the fin-stabilized bullet of Fig. 5, the supported internal core is produced in protruding form, as indicated in Fig. 8 which shows the internal core, the front end of which extends beyond the front face of the bullet. In this embodiment, the internal core (20) comprises a head (21) of frustoconical shape, the small base facing forward. The two parts (20) and (21) of the internal core may of course consist of one and the same homogeneous part.

As shown by Fig. 8, a space separates the front face (22) of the bullet and the edge of the head (21) of the internal core, to make it easier for the bullet to deform upon impact with the target.

In the alternative form of full-caliber spin-stabilized bullet depicted in Fig. 9, the internal core comprises a front core element (23) associated with balls (24).

The rear element consists of several metal balls (24). The diameter of the balls is roughly equal to that of the internal core, which means that the balls are  
5 held in place in the axial hole (5) by the front element (23). Upon impact with the target, deformation of the head of the bullet is similar to that depicted in Fig. 3, and has the effect of causing the front element (23) of the internal core to detach and release the balls (24).

Figure 10 depicts a spin-stabilized bullet with the same caliber as the  
10 weapon, similar to the one in Fig. 1, comprising a base (1), a body (2) provided with circular grooves (3) and a profiled front part (4), all this having passing all the way through it a hole (25) in which an internal core comprising a rear element (26) and a front element (27) is placed.

The rear element (26) of the core has a screwthread (28) collaborating with  
15 the tapping (29) formed on the interior surface of the hole (25). This arrangement allows the rear element (26) to be secured into the body of the bullet. By contrast, the front element (27) of the internal core is forcibly inserted into the front part of the hole (25).

Upon impact with the target, the rear element (26) of the internal core  
20 remains secured to the body of the bullet, the front part of which is folded from the

middle outward, as shown in Fig. 11, while the front element (27) of the internal core has been released.

Tests carried out using ammunition according to the present invention, fired against blocks of plastics material (PLASTILINE®), demonstrated excellent effectiveness, particularly controlled deformation of the bullet upon impact with the target, as shown by Figs. 3, 6 and 11, better than that of conventional lead ammunition.

The invention can be applied to core bullet ammunition for hunting weapons of all calibers, with smooth bore or rifled barrel.

**WHAT IS CLAIMED IS:**

1. Ammunition for small-, medium- and large-caliber weapons, consisting of a bullet with the same caliber as the weapon or which is subcaliber,  
5 comprising a profiled front part (4), a central part (2), and a rear part (1) which may bear fins (12), characterized in that the bullet contains, along its axis, an internal core (6) with rigidity greater than that of the body of the bullet.

2. The ammunition as claimed in claim 1, characterized in that the internal core (6) extends over the front part (4) and the central part (2) of the  
10 bullet.

3. The ammunition as claimed in claim 2, characterized in that the internal core (6) is housed in an axial hole (5) which is open at the front of the bullet.

4. The ammunition as claimed in claim 3, characterized in that the  
15 internal core (26, 27) passes right through it and runs from the rear part to the front part of the bullet.

5. The ammunition as claimed in either of claims 3 and 4, characterized in that the front face of the internal core is set back from the front face of the front part of the bullet.



6. The ammunition as claimed in either of claims 3 and 4, characterized in that the internal core (20) protrudes and its front end (21) extends beyond the front face (22) of the bullet.

7. The ammunition as claimed in any of claims 1 to 6, characterized in  
5 that the internal core (6) consists of one single homogeneous element.

8. The ammunition as claimed in any of claims 1 to 6, characterized in that the internal core consists of at least two consecutive elements (15, 16) arranged contiguously along the same axis.

9. The ammunition as claimed in claim 8, characterized in that the  
10 internal core comprises a first cylindrical element (23) and one or more balls (24) of approximately equal diameter.

10. The ammunition as claimed in any of the preceding claims, characterized in that the internal core consists of a rod (6) having symmetry of revolution and comprising ribs over part of its surface.

11. The ammunition as claimed in claim 10, characterized in that the  
15 internal core (6) has annular, helical or longitudinal ribs.

12. The ammunition as claimed in claim 11, characterized in that the internal core has two to six longitudinal ribs (7) arranged symmetrically with respect to the axis.

13. The ammunition as claimed in any of claims 3 to 6, characterized in that the front part of the body of the bullet has rupture initiators.

14. The ammunition as claimed in any of the preceding claims, characterized in that the internal core (6) is made of steel, brass, copper or  
5 aluminum alloy.

15. The ammunition as claimed in any of the preceding claims, characterized in that the body of the bullet is made of copper or brass containing  
5 to 40% zinc.

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FIG.1

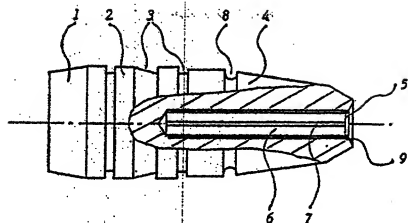


FIG.2

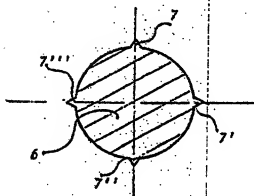
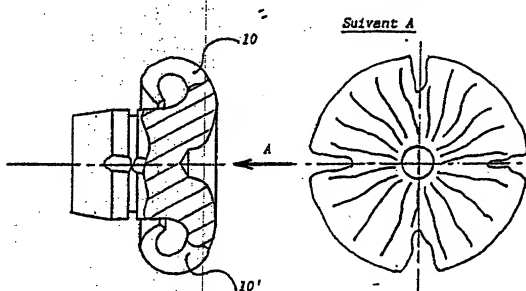


FIG.4

Suivant A

FIG.3



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FIG. 5

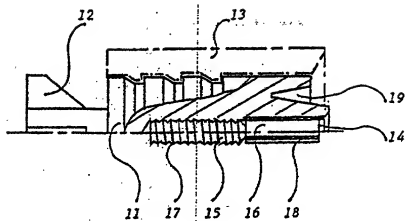


FIG. 6

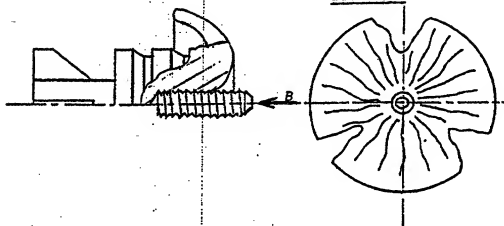
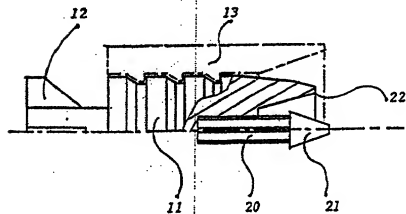


FIG. 8



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FIG. 9

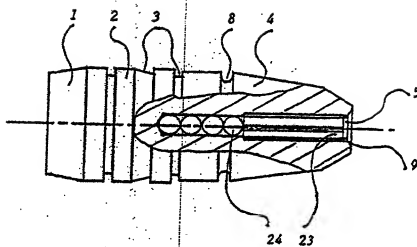


FIG. 10

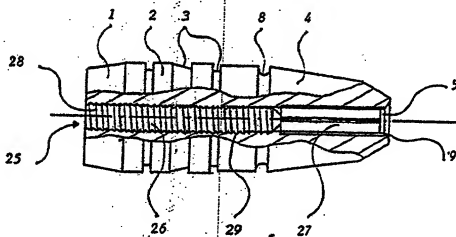
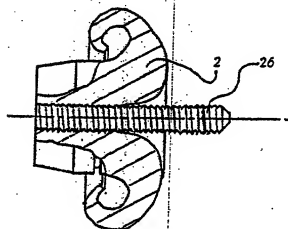


FIG. 11



**COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY**  
**(Includes Reference to PCT International Applications)**

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

**BULLET WITH AN INTERNALLY CARRIED SUB-PROJECTILE**

the specification of which (check only one item below):

- ☒ is attached hereto.
- ☐ was filed as United States application  
Number \_\_\_\_\_ on \_\_\_\_\_  
and was amended on \_\_\_\_\_ (if applicable).
- ☒ was filed as PCT international application  
Number PCT/FR00/01677 on June 16, 2000  
and was amended on \_\_\_\_\_ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 (a)-(d) of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. § 119(a)-(d):					
COUNTRY (if PCT, indicate "PCT")	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 35 U.S.C. § 119		
PCT	PCT/FR00/01877	16 June 2000	X	Yes	No
French	99/07760	18 June 1999	X	Yes	No
				Yes	No
				Yes	No
				Yes	No

I hereby appoint the following attorneys and agent(s) to prosecute said application and to transact all business in the Patent and Trademark Office connected therewith and to file, prosecute and to transact all business in connection with international applications directed to said invention:

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

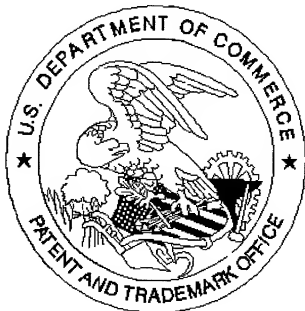
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COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY (CONTINUED) (Includes Reference to Provisional and PCT International Applications)		ATTORNEY'S DOCKET NO. 032013-036
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RESIDENCE SAINT-DOULCHARD, FRANCE		DATE 14/12/01
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RESIDENCE		DATE
CITIZENSHIP		
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FULL NAME OF THIRD JOINT INVENTOR, IF ANY		SIGNATURE
RESIDENCE		DATE
CITIZENSHIP		
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